Attachment H

Proposal # 2001- K-207 (Office Use Only)

PSP Cover Sheet (Attach to the front of each proposal)

Proposal Title: Lower Yuba River Monitoring and Research Program

Applicant Name: Foster Wheeler Environmental Corporation

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Amount of funding requested: $ 858,111

Some entities charge different costs dependent on the source of the funds. If it is different for state or federal funds list below.

State cost _____ Federal cost _____

Cost share partners? ____ **Yes** __X__ **No**

Identify partners and amount contributed by each _____

Indicate the Topic for which you are applying (check only one box).

- ☐ Natural Flow Regimes
- ☐ Nonnative Invasive Species
- ☐ Channel Dynamics/Sediment Transport
- ☐ Flood Management
- ☐ Shallow Water Tidal/ Marsh Habitat
- ☐ Contaminants
- ☐ Beyond the Riparian Corridor
- ☐ Local Watershed Stewardship
- ☐ Environmental Education
- ☐ Special Status Species Surveys and Studies
- ☒ Fishery Monitoring, Assessment and Research
- ☐ Fish Screens

What county or counties is the project located in? Yuba

What CALFED ecozone is the project located in? See attached list and indicate number. Be as specific as possible # 8

Indicate the type of applicant (check only one box):

- ☐ State agency
- ☐ Public/Non-profit joint venture
- ☐ Local government/district
- ☐ University
- ☐ Other: _____
- ☐ Federal agency
- ☐ Non-profit
- ☐ Tribes
- ☒ Private party

Indicate the primary species which the proposal addresses (check all that apply):

☐	San Joaquin and East-side Delta tributaries fall-run chinook salmon		
☐	Winter-run chinook salmon	☒	Spring-run chinook salmon
☒	Late-fall run chinook salmon	☐	Fall-run chinook salmon
☐	Delta smelt	☐	Longfin smelt
☐	Splittail	☐	Steelhead trout
☐	Green sturgeon	☒	Striped bass
☐	White Sturgeon	☐	All chinook species
☐	Waterfowl and Shorebirds	☐	All anadromous salmonids
☐	Migratory birds	☒	American shad
☐	Other listed T/E species: _____		

Indicate the type of project (check only one box):

☒	Research/Monitoring	☐	Watershed Planning
☐	Pilot/Demo Project	☐	Education
☐	Full-scale Implementation		

Is this a next-phase of an ongoing project? Yes ____ No X
Have you received funding from CALFED before? Yes ____ No x

If yes, list project title and CALFED number_____

Have you received funding from CVPIA before? Yes ____ No X

If yes, list CVPIA program providing funding, project title and CVPIA number (if applicable):

By signing below, the applicant declares the following:

- The truthfulness of all representations in their proposal;
- The individual signing the form is entitled to submit the application on behalf of the applicant (if the applicant is an entity or organization); and
- The person submitting the application has read and understood the conflict of interest and confidentiality discussion in the PSP (Section 2.4) and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant, to the extent as provided in the Section.

G. LYNN SPRAGUE
Printed name of applicant

Signature of applicant

FOSTER WHEELER ENVIRONMENTAL CORPORATION

May 15, 2000

CALFED Bay – Delta Program
1416 Ninth Street, Suite 1155
Sacramento, CA 95814

Subject: CALFED PROPOSAL

Foster Wheeler Environmental Corporation is pleased to submit the attached original proposal, ten complete hard copies, and one electronic copy to CALFED to conduct scientific research on the lower Yuba River for the Yuba River Fisheries Technical Working Group.

I am pleased to offer the services of Mr. Thomas Cannon as project manager and principal investigator. He has 16 years of service with Foster Wheeler and is one of our most experienced project managers and senior aquatic ecologists. He has a strong personal interest and commitment to the CALFED Program and the lower Yuba River ecosystem. Over the past several years he has dedicated considerable personal and company time staying on top of issues and scientific investigations on these rivers. I also offer the commitment of our company in support of the studies and the CALFED Program. Several years ago I was a member of the CALFED Management Team representing the US Forest Service. So I also have experience, interest, and commitment to the Program. As project sponsor I will be available to promote the project and participate in professional and stakeholder activities.

In addition to Mr. Cannon, we offer the services of our most experienced fluvial geomorphologist, Dr. Thomas Stewart, and our GIS team. In addition to the standard ArcInfo/ArcView technology, we have just upgraded our office capabilities with new Pentium III computers and the most up to date ArcView software capabilities.

To provide experienced survey capability and to make our proposal cost effective, we have teamed with the Fishery Foundation of California, Natural Resources Scientists Inc., the US Geological Survey, and graduate students at UC Davis. As potential backup we have arranged potential support from Chico State University.

The objective of the study is to provide technical information on fish passage at Daguerre Point Dam on the Yuba River. We believe the study will help to identify economically feasible measures to enhance fish passage for salmon and steelhead populations of the lower Yuba River.

Sincerely,

G. Lynn Sprague
Northern California Operations Manager

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Title Page and Executive Summary

Lower Yuba River Monitoring and Research Program

A Proposal to Conduct a Monitoring and Research Program to Support Federal and State Actions Related to Improving Salmon and Steelhead Passage and Habitat on the Lower Yuba River in Yuba County, California.

Submitted by:
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In partnership with:
Fishery Foundation of California
US Geological Survey
Natural Resources Scientists Incorporated
Chico State University
On Behalf of the:
Yuba River Fisheries Technical Working Group
Participating Agencies/Organizations Include:
Yuba County Water Agency, Pacific Gas & Electric Company, Reclamation District 784, U.S. Fish and Wildlife Service, California Department of Fish and Game, California Department of Water Resources, National Marine Fisheries Service, South Yuba River Citizens League, and Friends of the River.

Summary of Proposed Research: The YRFTWG proposes to study fish passage and predation, and the mercury content of the sediment at Daguerre Point Dam on the lower Yuba River. Information obtained from this research will be essential in evaluating alternatives for improving fish passage at Daguerre Point Dam, a CALFED and CVPIA priority action. Adult salmon and steelhead will be marked and tagged to assess their progress past Daguerre Point Dam. The distribution of adult salmon and steelhead as well as striped bass, pikeminnow, and American shad relative to the dam will be assessed through snorkel surveys. Predation rates on juvenile salmon and steelhead passing downstream past the dam will be studied through (1) stomach analyses of striped bass, American shad, and pikeminnow, and (2) tethering experiments with hatchery-reared juvenile salmon and steelhead. The adequacy of the adult salmon and steelhead holding habitat below the dam will be assessed through a survey of holding habitats above and below the dam. Hypotheses being tested include: (1) are adult salmon and steelhead blocked or hindered by the dam, (2) are juvenile salmon and steelhead passing downstream past the dam being excessively preyed upon by predatory fish, (3) is adult salmon and steelhead holding habitat below the dam adequate, and 4) are sediments behind the dam contaminated with mercury. The study involves quarterly sampling of fish near the dam and includes external tagging and radio tagging of adult salmon and steelhead, and monitoring of the fish below the dam, within the fish ladders at the dam, and in passage upstream of the dam to upstream holding and spawning areas. The studies will be coordinated with (1) DFG's juvenile screw trapping below the dam and adult salmon trapping in the dam, (2) CALFED/YCWA/UCDavis steelhead trapping, habitat, and life history studies, and (3) YRFTWG's CALFED grant study to develop and ecosystem restoration implementation plan for the lower Yuba River.

Project Description

The Yuba River Fisheries Technical Working Group (YRFTWG) requests funds from CALFED and CVPIA to conduct targeted fisheries-related research on the lower Yuba River. Technical information derived from this research will be fundamental in deciding what alternatives should be chosen to resolve salmon and steelhead passage problems at Daguerre Point Dam (Daguerre Dam) and ultimately what restoration actions should be prescribed for the Yuba River. Information from this study will improve our understanding of the ecological and physical processes affecting the salmon and steelhead populations of the lower Yuba River and other rivers of the Central Valley. What we learn in these studies will be instrumental in designing future restoration actions for the Yuba River and other rivers in the Central Valley.

1. Statement of the Problem

a. Problem

The YRFTWG was established to help refine, evaluate, and prioritize anadromous fish enhancement/restoration actions for the Yuba River. A key element of the evaluation is how to solve the fish passage problems at Daguerre Dam, a debris dam constructed in 1906 approximately 12 miles upstream from the mouth at the Feather River (see attached photos of dam). The Anadromous Fish Restoration Program (AFRP) and CALFED's Ecosystem Restoration Program have identified fish passage at Daguerre Dam as an important issue and a high priority restoration action. Engineering options involving Daguerre Dam are presently being evaluated by the US Army Corps of Engineers, Sacramento District with funds provided by the AFRP. The YRFTWG has begun to develop an implementation plan for anadromous fish restoration (project was funded by CALFED in 1999).

The YRFTWG needs to conduct targeted research to provide technical information necessary to fully evaluate alternatives to improve anadromous fish passage at Daguerre Dam and in developing an implementation plan for enhancing and restoring anadromous fish and their habitat in the Yuba River. Technical information is lacking on fish passage. Is the fish ladder system effective in passing adult salmon and steelhead upstream past the dam? Is predation on downstream migrating juvenile salmon and steelhead at the dam a problem? Information will also be need on the extent of mercury contamination of the sediments behind the dam to determine risks from present ladder maintenance activities and future options including construction of new fish passage facilities or dam removal.

b. Conceptual Models, Hypotheses, and Adaptive Management

Anadromous fish production on the lower Yuba River below Englebright Dam is controlled by a number of variables and limiting factors. The following conceptual models outline the factors that may control the populations and where there are uncertainties. Hypotheses described in Figure 1 are provided in the form of null hypotheses relating to each of the uncertainties and conceptual models. The identified uncertainties preclude pilot or full-scale implementation of restoration actions at this time on the lower Yuba River. The goal of the proposed targeted research efforts is to address the uncertainties so that pilot and full-scale implementation can begin on the Yuba River including actions to improve fish passage at Daguerre Dam.

A. Upstream Passage of Adult Anadromous Fish – Of the six species of anadromous fish that are known to migrate into the Yuba River, four (white sturgeon, green sturgeon, striped bass, and American shad) are blocked by Daguerre Dam, and two (chinook salmon and steelhead) are potentially hindered by inadequate fish ladders at the dam. At issue is the extent of hindrance by the dam (and its associated passage facilities) on salmon and steelhead.

A. Upstream Migration of Adult Anadromous Fish

Hypothesis #A1: Adult salmon and steelhead are not blocked or delayed in their upstream migration past Daguerre Dam.
Hypothesis #A2: Adult salmon and steelhead blocked or hindered by Daguerre Dam survive to spawning as well as they would without the Dam.

B. Downstream Migration of Juvenile Salmon and Steelhead

Hypothesis #B1: There are no unusually high concentrations of predators below Daguerre Dam.
Hypothesis #B2: Predation rates below Daguerre Dam are not unusually high.

C. Habitat of Salmon and Steelhead

Hypothesis #C1: Over-summering habitat above and below Daguerre Dam is limited by lack of deep cool water pools.

D. Contamination of Sediments behind Daguerre Dam

Hypothesis #D1: Sediments and pore waters behind Daguerre Dam are not contaminated with mercury or methyl mercury.

Figure 1. Hypotheses for Lower Yuba Studies.

Spring-run chinook salmon begin arriving at the dam in early spring. Fall-run begin arriving in summer and continue through the fall. Steelhead begin arriving at the dam in late summer and fall and continue through the winter. There is uncertainty as to whether either species' accent of the river is delayed or blocked such that they are subject to adverse conditions and reduced survival below the dam or in passage over the dam, and whether their ultimate reproductive success is adversely affected.

Another important uncertainty is the role the dam plays in blocking migratory striped bass, American shad, and pikeminnow from the river above the dam. In order to evaluate the effect of potential competition and predation above the dam, studies are needed on passage of these species at the dam. American shad and pikeminnow may be able to navigate the fish ladder under certain conditions. Their migration above the dam may be detrimental to salmon and steelhead production above the dam.

There is uncertainty as to whether delays or blockage by the dam subjects the salmon and steelhead to stressful water temperatures or injury from attempts to ascend the face of the dam or fish ladders. There is also uncertainty as to overcrowding in spawning and holding habitat below the dam, and predation from birds, humans, or striped bass (jack salmon and smaller adult steelhead are likely prey of striped bass). Adequacy of holding habitat below the dam is an important consideration because adult salmon may spend several weeks or more in large pools before ascending to spawning areas (Burger et al. 1985). Identification of a viable solution for fish passage at the dam may weigh heavily on a complete understanding of the extent and characteristics of these potential problems.

B. Over-Summering Habitat of Adult Salmon and Steelhead – The adequacy of adult over-summering holding habitat above and below Daguerre Dam is an important uncertainty in evaluating whether passage problems have an ultimate effect on the population. Adults migrating upstream in spring and summer require deeper pools with cooler water to survive the summer. Over-summering habitat below Daguerre Dam may be excessively warm in some years, leading to higher pre-spawn mortality and lower reproductive success. Deeper cool-water holding habitat may also be inadequate in the lower river downstream of the dam. Stream flow and cool-water releases from upstream dams also affects over-summering water temperature. Channel configuration and riparian shade are also temperature factors, as is input of warm water from Deer and Dry Creeks, two tributaries to the lower river below Englebright Dam (and above Daguerre Dam).

Gravel mining, bank protection, large woody materials, and levee construction above and below Daguerre Dam may also be factors that affect the amount of holding habitat available. Altered flow and sediment transport also contribute to an altered stream channel that limits available over-summering habitat. Altered flow and sediment transport regimes may also affect riparian habitat recruitment and retention along the river channel, which would affect streamside cover, bank stability, and recruitment of large woody debris into the stream channel.

C. Downstream Passage of Juvenile Salmon and Steelhead – Chinook salmon and steelhead young generally pass downstream of Daguerre Dam from late fall through spring. Salmon may pass downstream as fry in winter, as fingerlings and smolts in spring, or as yearlings the following late fall and winter. Steelhead generally pass downstream as yearling or older smolts in winter and spring, but also pass downstream as fry or sub-yearlings to rearing areas below the dam. Surviving post-spawn adult steelhead must also pass downstream of the dam in winter and spring if they are to successfully return to the ocean and subsequently return to spawn again in the river.

There are uncertainties as to whether downstream passage is either adversely affected by the dam or subjects migrating fish to excessive rates of predation from predators below the dam. High concentrations of predators including striped bass, pikeminnow, and American shad below the dam may reduce smolt production as documented at the Red Bluff Diversion Dam on the Sacramento River (Hall 1977, USBR 1983, Vogel et al. 1988) and Columbia River system (Fast et al. 1991, Willis and Young 1995)[1]. While other factors associated with these species, such as competition, may also affect salmon and steelhead production, predation is believed to be a particularly influential biotic factor (Baltz and Moyle 1993; Lodge 1993). Although native to the Central Valley, pikeminnow populations may be experiencing greater than normal population abundance because of altered flow regimes that exist under current water management practices (e.g., higher than normal summer flows and reduced flood peaks). Furthermore, the altered habitat conditions in the lower rivers (e.g., diversion dams, reduced instream cover) may allow pikeminnow to forage more successfully than under historical conditions (Fast et al. 1991). Higher water temperatures may also contribute to higher predation by pikeminnow (Vigg and Burley 1991). Again, the selection of an engineering solution to fish passage at Daguerre Dam may depend on type and extent of predation as well as how predation and other mortality occurs above, at, and below the dam.

Predation of migrating juvenile salmonids near dams has been found to be quite high in other systems both as a result of the portion of diet being juvenile salmonids and from the high concentration of predators associated with dams. In a predation study conducted on the John Day reservoir on the Columbia River, Poe et al. (1991) found that pikeminnow predation on juvenile salmonids was much higher near dams than in the main reservoir. An estimated 78% and 66% of pikeminnow diet in the tailrace and forebay of the reservoir, respectively, was juvenile salmonids, while at two other reservoir locations salmonids only constituted 8 and 19% of their diet. Additionally the density of squawfish in the tailrace area was 6 to 30 times higher than in the main reservoir areas.

D. Contamination of Sediments behind Daguerre Dam –The degree to which sediments behind Daguerre Dam are contaminated with mercury from past gold mining in the Yuba watershed is an important factor that must be addressed when considering the various options for fish passage at the dam. The potential exists for elevated concentrations of mercury to exist in sediment layers behind Daguerre Dam, and for a significant portion of the mercury to be in highly bioavailable forms such as methyl mercury. Elemental mercury, which is relatively inert, tends to transform to methyl mercury in anaerobic environments. Sediments behind the dam may already be contributing methyl mercury to the lower Yuba River, the lower Feather and Sacramento rivers, and the Bay-Delta. Sediment fills the entire pool behind the dam. Sedimentation behind the dam has led to the need for maintenance dredging to maintain exits to the fish ladders and approaches to water diversions above the dam. Such maintenance may be disturbing mercury-laden sediment and allowing mercury to be released to the Yuba River. The extent of mercury and methyl mercury contamination of the sediments and pore waters behind

[1] The study by Fast et al. (1991) was on the Yakima River in Washington, which is similar in many ways to the Daguerre and Red Bluff situations being located in a warm region with low elevation diversion dams. The study included adult fish radio tagging. The study concluded that the fish the ladder and dam caused some fish that traditionally passed further upstream to spawn downstream of the dam, resulting in a spawning component of chinook developing downstream of the dam. They also found that downstream passage mortality of smolts at the dams was high due to large numbers of pikeminnow below these dams. They noted that pikeminnow abundance was highest in the spring when smolts were emigrating and concluded that the majority of smolts were likely lost to pikeminnow predation.

the dam is an important issue for which information is needed in dealing with various resource management options, including maintaining the existing dam with present or new passage facilities, or removing the dam.

The vast majority of mercury contamination in the Yuba River system was introduced during the period from 1857-1900 in conjunction with placer-gold mining. Hundreds of thousands (or perhaps even millions) of pounds of mercury likely remain in historically mined areas of the upper Yuba River and Bear Rivers watersheds (Alpers and Hunerlach, 2000) and these mine sites remain a significant source of surface water contamination. USGS studies have found an overall correlation between the level of mercury bioaccumulation and the amount of hydraulic placer mining in Sierra Nevada watersheds, with the Yuba River being one of the most affected (Hunerlach et al. 1999). Because Daguerre Dam was constructed to capture placer mine sediments transported down the Yuba River early in the 20th century, there may be large amounts of mercury stored in the sediments behind the dam. Concern also exists that such sediments are likely to be anaerobic, so that a relatively high proportion of the mercury may be in the more toxic and bio-available methyl mercury form.

2. Proposed Scope of Work

The following scope of work identifies the specific proposed targeted research that addresses uncertainties and hypotheses identified above.

a. Location and Geographic Boundaries of the Project

The proposed research would occur along the lower Yuba River in Yuba County from Englebright Dam downstream to the mouth at Marysville (Figure 2). The Yuba River is a tributary to the Feather River and is part of the Feather River Sutter Basin Ecological Zone. Daguerre Dam is located approximately at the mid-point of the 24 miles of the lower Yuba River below Englebright Dam.

b. Approach

The following sections describe the approach to addressing the uncertainties described above. Each section is organized by hypotheses that relate directly to the uncertainties and project objectives. Hypotheses are outlined in Figure 1.

A. Upstream Migration of Adult Anadromous Fish

Hypothesis #A1 – Salmon and steelhead are not blocked or hindered by the dam.

To test this hypothesis an adult sampling survey and an experiment are proposed.

Task 1: Adult Salmon and Steelhead Distribution

Snorkel and boat observation surveys will be conducted quarterly in the summer, fall, winter, and spring, conditions permitting, to document the relative numbers of adult salmon and steelhead in the Yuba River from Englebright Dam to Marysville. Specific emphasis will be on the numbers of salmon and steelhead immediately above and below Daguerre Dam to test the hypothesis that there is no difference in abundance above or below the dam. Large concentrations of salmon and steelhead below Daguerre Dam would be indicative of some degree of blockage by the dam. Adult salmon and steelhead can be readily identified and counted except following major storms.

Task 2: Adult Salmon and Steelhead Movement Past Daguerre Dam

Adult fall chinook salmon and steelhead will be collected from the lower Yuba River, marked with external tags and radio tags, and then released and tracked on their upstream migration to and past Daguerre Dam. (Note that fall chinook will be used as surrogates for spring chinook. Expected flows facing spring chinook may not be available for fall chinook tests, therefore we propose short term storage releases to emulate higher flow conditions at the ladders for some of our proposed experiments.) The basic experimental design will be similar to prior investigations

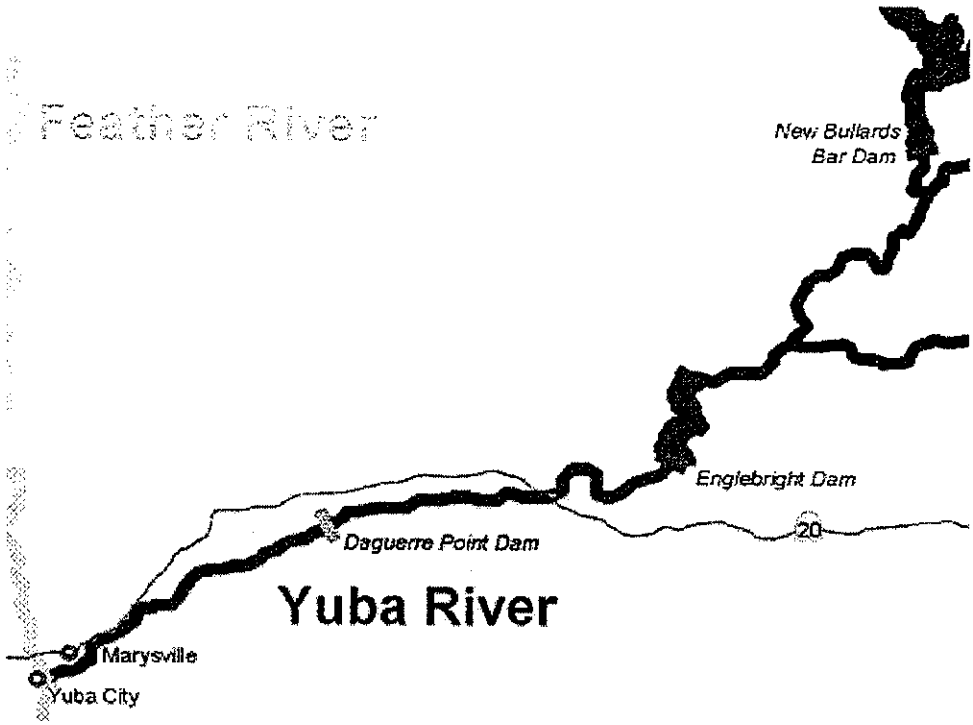


Figure 2. Lower Yuba River study area between Marysville and Englebright Dam. Studies are focused at Daguerre Point Dam where salmon and steelhead are potentially blocked or hindered in their migrations to spawning areas below Englebright Dam.

by the California Department of Fish and Game (Hallock et al. 1982) and the U.S. Fish and Wildlife Service (Vogel et al. 1988) in highly successful fish passage studies at Red Bluff Diversion Dam on the Sacramento River. Experience from the Columbia and Snake Rivers (Mendel et al. 1994) will also be drawn upon for the study. Appropriate fish handling protocols will be employed to minimize radio-tagging effects on normal fish behavior. External tagged fish will be noted in fish collected in the ladders at Daguerre Dam and in carcass surveys (salmon only) during the spawning season. Rate of movement of approximately 40 radio-tagged individuals of each species will be documented each year for two years (est. maximum of 160 total fish). Allocation of radio tags will be distributed among study fish to approximate normal fish run timing. For example, most of the radio tags will be distributed within the peak of the run timing but some radio tags will be applied to fish in the early and late portion of the salmon and steehead runs. Distribution of tagged fish over different seasons is expected to help segregate the effects of level of fish sexual maturity on migratory timing as compared to anthropogenic conditions (e.g., delay in dam passage) that may affect fish migration behavior. In addition, monitoring radio-tagged fish during different seasons over two years will increase the probability of acquiring fish migration and passage data for a wide range of environmental conditions. Special attention will be given to movement past Daguerre Dam including time to passage to and through the ladder and any holding time in the pool below the dam. The incidence of fish delay and fallback behavior at the dam will be documented. The design includes monitoring fish movement in late spring (fall chinook) under higher spring flows (if nature obliges or from controlled releases), late summer and fall under low flows, and if conditions permit in winter under high flows. A control group of radio-tagged fish will be released above the dam to compare movement of fish released below the dam. Experimental fish for radio tagging will be collected in the lower river downstream of the dam. As a last resort fish collected from traps in the ladder will be used.

Task 3: Survey of Hydraulic Characteristics of Daguerre Dam and Ladders

Hydraulic conditions at Daguerre Dam and in the fish ladders will be measured under a range of river flows to characterize hydraulic patterns at dam-ladder structures. This information will be useful in evaluating the effectiveness of the existing ladders and what design changes may be necessary to improve fish attraction to and passage through the ladders.

Hypothesis #A2 – Fish blocked or hindered by the dam survive to spawning.

Numbers of salmon dying prior to spawning will be documented above and below the dam and compared to the numbers observed above and below the dam (Task 1). Also radio-tagged salmon will be tracked for up to one month after tagging to ascertain survival. A comparison will be made between the control (above dam release) and treatment (below dam release) groups (Task 2).

B. Downstream Migration of Juvenile Salmon and Steelhead

Hypothesis #B1: There is no predator concentration below Daguerre Dam.

Task 1 Modification– Adult Fish Survey modification to include predator species.

Predators including striped bass, pikeminnow, and American shad will also be included in the adult fish survey (Task 1).

Hypothesis #B2: Predation rates immediately below Daguerre Dam are not unusually high.

Task 4 – Predation rate survey

Predators will be collected with gill nets, beach seines, spears, and/or angling gear at various locations above, at, and below Daguerre Dam during the spring, summer, fall, and winter. Numbers of young salmon and steelhead in their stomachs will be documented. Numbers per predator will be extrapolated to total numbers from Task 1 survey data to determine the relative importance of predation at the dam, as well as downstream and upstream of the dam. Additional information on relative predation rates will be collected using tethering studies similar to those described by Gregory and Levings (1998) and Grimaldo et al. (2000). Juvenile salmon and

steelhead (hatchery reared) will also be released on tethers to determine rates of predation among the various locations downstream of the dam. Rates will be compared among locations to determine if rates are higher immediately below the dam than in natural habitats further downstream or upstream of the dam. Tethering studies will be conducted once each season. In general, tethering studies involve taking small (approximately 50-200 mm) fish and threading lightweight (e.g., 2-lb. test) monofilament line through the operculum and out the mouth of the fish before tying it off to itself to form a loop in the line. The lightweight monofilament line is then attached to a second monofilament line of greater tensile strength, which is in turn anchored to the stream bottom with a lead weight of one to several pounds. A total of six tethered fish will be anchored at each study site, with two tethered in shallow water, two in locations with moderate water depth, and two in deep water. The actual depths at which tethered fish will be placed will be based on the range of water depths present at the time and location of the experiment. Tethered fish will be set for one hour intervals, after which time tethers will be checked for evidence of predation (absence of prey) or predator attack (partially consumed or injured prey).

C. Habitat of Salmon and Steelhead

Hypothesis #C1: Over-summering habitat above and below Daguerre Dam is limited.

Task 5 – Survey of Over-Summering Habitat

The stream channel configuration of the lower Yuba River will be studied from available Corps of Engineers data, aerial photo surveys, and field survey notes (Task 1). Holding habitat will be estimated and compared to escapement estimates available to determine if holding habitat is adequate in amount and distribution above and below Daguerre Dam. Factors affecting stream channel configuration will be reviewed including sediment transport, substrate composition, flood scour, riparian vegetation, canyon wall constraints, gravel mining, levees, and bank protection. Maps and charts of holding habitat will be developed.

The task includes mapping and assessment of holding habitat along the study reach. Mapping will incorporate the snorkel survey and pool temperature data into a GIS database. Additionally, the USGS maps and aerial photographs along with Corps Comprehensive study data will be used to delineate the location and overall morphology of the existing pools. The GIS database will be used to generate a series of maps that display the seasonal temperature and temperature stratification determined from field measurements.

Two days of fieldwork are included to provide information on the types of physical controls that influence the location and type of holding pools (e.g., bank protection, channel bends, levees, valley wall constrictions, large woody debris). Based on this field review and an examination of the maps and aerial photographs of the area an overview report will be prepared. The report will describe the pools, their location and morphology, and the physical controls that influence location and the quality of holding habitat. A general discussion will also be presented on the interrelationship of the structure and location of the pools and the associated water temperature.

Temperature recorders will be set in a sample of potential over-summering habitat above and below Daguerre Dam. Recorder will be located in upper and bottom layers in each sampling location. Selected temperature profiles will be determined at each station to document the three-dimensional characteristics of the temperature profile at each sampling location. Characteristics at sampling locations will be compared to over-summering use by salmon and steelhead as determined from Task 1 surveys.

D. Characterization of Sediments behind Daguerre Dam

Hypothesis #D1: Sediments and pore waters behind Daguerre Dam are not contaminated with mercury or methyl mercury.

Task 6 – Sample sediments and pore waters behind Daguerre Dam and analyze for toxins.
Sediment and pore water samples will be collected from several locations behind Daguerre Point Dam to test for contamination by mercury, methyl mercury, and other toxins. Sampling of the sediment profile will be accomplished using drilling methods designed to get representative samples of the sediment, which is expected to be highly heterogeneous with respect to grain-size distribution and mercury content. Drilling methods must also account for the presence of cobbles (4-to-12-inch-diameter rocks) that armor the river bed and may also be present at depth. A large-diameter (36-inch) drill casing will be used to ensure that penetration through the sediment will be achieved and that sample volume will be adequate to avoid the "nugget effect" resulting from sediment heterogeneity.

Six drilling sites are considered the minimum that will provide adequate characterization of the sediments trapped behind Daguerre Point Dam. The height of the dam is 28 feet (about 8 meters). The sediment trapped behind the dam is expected to form a wedge shape that thins upstream. Sediment samples will be composited in vertical intervals of 3-6 feet (1-2 meters), such that a total of about 24 discrete intervals will be sampled from the six drilling sites. In addition, a vertical composite sample will be prepared from each drilling site for the purpose of separating mercury by gravity concentration methods. Drilling methods will be designed to penetrate into the first foot of bedrock to evaluate mercury accumulation in cracks and fractures. Drilling will terminate at an elevation that represents the best estimate of pre-dam topography, if bedrock is not encountered at the expected depth.

Contaminants to be analyzed in all sediment samples are mercury, methyl mercury, and arsenic. Other potential contaminants including other heavy metals (such as cadmium, copper, lead, and zinc) will be analyzed on a screening basis in a subset (about one-third) of the samples collected. Concentrations of mercury, methyl mercury, and arsenic will be determined in several different size fractions of sediment from each of the vertically composited samples, whereas the fine-grained fraction (less than 63 micrometers) will be used for other sediment samples for consistency. A subset of the sediment samples (about 12) will be analyzed for forms of mercury (speciation), to determine the proportion of mercury occuring as elemental mercury. Six sediments samples (one from each drilling site) will be analyzed for mercury methylation and demethylation potential using a radioactive mercury and carbon tracers. More complete analyses will be made of these six sediment samples, including total carbon, organic carbon, total sulfur, acid volatile sulfur, and trace elements. Grain-size distribution will be determined for sediment samples from each depth interval and for the vertical composites. Mercury, methyl mercury, arsenic, and heavy metal concentrations will also be determined in pore waters separated from sediment taken from discrete sampling intervals in the bore holes and from water discharged during gravity concentration of composite samples. For all water samples, measurements of unstable water-quality parameters (temperature, pH, specific conductance, and dissolved oxygen) will be made in the field. A subset of the pore waters (about one-third) will be analyzed more completely, including major cations and anions, trace metals, nutrients, and organic carbon (dissolved and suspended).

E. Project Management

Task 7 – Project Management
Foster Wheeler Environmental Corporation (FWENC) would serve as project manager and grant recipient on behalf of its research partners[2] and the YRFTWG. FWENC, the Fisheries Foundation, Natural Resources Scientists Inc, and the US Geological Survey would conduct

[2] The contract for the USGS would be handled directly through interagency agreement between USGS and CALFED.

research elements. The YRFTWG would serve as a project oversight committee. The project management team will be responsible for ensuring completion of the study scope. Important activities include data handling and storage, reports, presentations, as well as project performance, communication, administration, and contracting activities. The project manager will ensure that project team members have the resources needed to conduct the tasks and will be responsible for safety on the project. The project manager will prepare a public involvement plan. The project manager and fish study manager will work with the principal investigators in developing a quality assurance program plan (QAPP). The project manager and principal investigators will be prepared to make project presentations at annual review meetings.

c. Data Handling and Storage

All data will be maintained in database (Microsoft Access and ArcView) or spreadsheet (Microsoft Excel) format and updated in a master database by the project manager. Principal investigators will maintain individual databases. Databases will be transferred to the CVPIA Comprehensive Assessment and Monitoring Program (CAMP) and the Interagency Ecological Program (IEP)

d. Expected Products/Outcomes

Study reports will be completed within 6 months of completion of each survey. Progress reports will be prepared monthly during sampling periods and bimonthly at other times. The project manager will prepare a program progress report annually with a summary of results for the year. Periodic progress reports will be given to the YRFTWG at their bimonthly meetings. A final report will be prepared at the end of the program.

e. Work Schedule

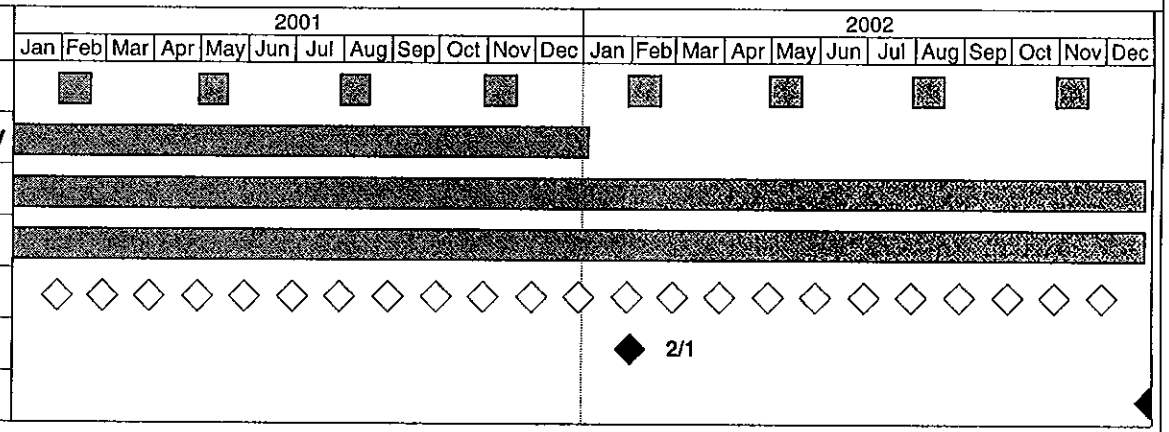
The proposed work schedule by task and key milestones is presented in Figure 3. All task are separable. Funding is proposed for the full 24 months. Additional funding may be requested in PSP 2002 or 2003 if surveys could not be completed because of unforeseen circumstances.

f. Feasibility

Participating agencies and private and university researchers have ESA research permits that will require amendment to conduct the proposed studies. Representatives of permitting agencies on the YRFTWG will help to facilitate the necessary permit modifications. Adjustments to the final study designs may be necessary because of limitations prescribed in ESA permits. Two full study years should provide a reasonable range of conditions and allow most of the proposed sampling and experimental work to be completed. Most of the hypotheses can be addressed adequately in the first year with the second year providing verification and possibly a more refined and directed approach. Surveys will be hampered by high turbid flows only after large winter storms. Sampling and experiments prescribed for the winter should be able to work around the storm events. Some work such as sampling fish in ladders can be accomplished during high turbid water. Much of the work is prescribed for the dry, clear-water, late spring through fall season. Sampling restrictions relating to the listed spring-run chinook and steelhead have been anticipated and the survey sampling has been designed accordingly. For example, hatchery-reared fish will be used in tether studies. Fall chinook will be used as a surrogate for spring chinook in passage studies. In the event that permits will not allow tagging of wild steelhead, adult hatchery steelhead are generally sufficiently abundant in the Yuba River to be used for such studies. Access available to the river and to the government-owned land around and at the dam is excellent. In most cases access to the dam area by the general public is limited and thus potential conflicts with the public will be minimal. Stakeholder and agency members of the YRFTWG will be called on to help ensure cooperation of the public and nearby landowners.

Figure 3. Project Schedule

ID	Task Name
1	**Tasks 1-4: Quarterly Surveys**
10	Task 5: Over-Summering Habitat Survey
11	Task 6: Sediment Study.
12	Task 7: Project Management
13	**Monthly E-mail Status Reports**
37	First Annual Progress Report
38	Two-Year Final Report



Applicability to CALFED ERP Goals and Implementation Plan and CVPIA Priorities

1. ERP Goals and CVPIA Priorities

CALFED's Strategic Plan (p. D-36) identifies Action 1 for Yuba River early implementation as a feasibility study for removing Daguerre Dam. The Plan also identifies two Adaptive Management Considerations:

- Compare escapement rates and use of spawning habitat upstream and downstream of the dam.
- Study predation rates on juvenile salmon downstream of the dam.

One of the prescriptions of the CVPIA Anadromous Fish Restoration Program (AFRP) for the Yuba River is to "*improve fish passage at Daguerre Point Dam*". The proposed study is a necessary step toward developing a solution for fish passage problems at the dam. The proposed study also is consistent with CALFED, CVPIA, DFG, and FWS goals for restoring populations of Central Valley anadromous fish.

- *Support additional research to address large deficiencies in information on steelhead life history.* The proposed study will provide valuable information on steelhead migration and movement, particularly relative to effects of dams on passage, as well as adult holding habitat.
- *Develop and implement restoration measures and protections that have a relatively high degree of certainty of increasing number and size of naturally spawning populations.* The proposed study should provide considerable information on factors affecting survival of adult and juvenile salmon and steelhead.

2. Relationship to Other Ecosystem Restoration Projects and System Wide Benefits

The studies in this proposal compliment and build on these and planned future studies. The California Department of Fish and Game (DFG), the Yuba County Water Agency (YCWA), and the US Fish and Wildlife Service (FWS) with funding from CALFED, AFRP, and YCWA have undertaken the following studies:

- YCWA conducts carcass count surveys each year to determine escapement of chinook salmon to the Yuba River. These surveys also determine the relative proportion of escapement above and below the dam, which helps toward assessing how much of the run is confined below the dam. This survey will also help in collecting fish tagged in Task 2.
- DFG and Jones and Stokes Associates (under a grant from CALFED and YCWA) monitor adult fish passage through the fish ladders at the dam to determine run timing and spring-run escapement. Ladder trapping by DFG will be a source experimental fish for tagging and for recovery of tagged fish. They also monitor spawning distribution of salmon and steelhead on a selected basis.
- DFG monitors downstream chinook and steelhead numbers via a screw trap below Daguerre Dam near Hallwood Avenue. DFG also monitors juvenile salmon and steelhead numbers in the Hallwood-Cordura diversion location immediately above Daguerre Dam. Data from these surveys will be helpful in defining seasonal downstream migration periods for juvenile salmon and steelhead.
- UC Davis Department of Fish, Wildlife, and Conservation under a grant from YCWA has conducted surveys of the distribution of juvenile steelhead in the lower Yuba River in 1999 and 2000. Data from this study may help in evaluating potential predation effects on juvenile salmon and steelhead. The UC Sierra station located between Daguerre Dam and the upstream Englebright Dam offers selected access to the river.

The proposed studies will complement other studies on fish passage and predation being conducted at the Red Bluff Diversion Dam (RBDD) and the Glenn-Colusa Irrigation District Fish Screen Improvement Project on the Sacramento River, the Woodbridge Dam on the Mokelumne River, and others on the Merced, Tuolumne, and Stanislaus Rivers. Results from these and the proposed studies will complement the information of the other and help determine the role that diversion dams play in Central Valley streams and rivers with regards to fish passage and predation.

The US Army Corps of Engineers and the California Department of Water Resources and Reclamation Board (DWR) are studying the lower Yuba River as part of the Sacramento and San Joaquin River Basins Comprehensive Study. Both agencies jointly own and operate Daguerre Dam. Engineering designs on the ladders and the dam will be available for this study. Information collected in the Corps recent evaluation of alternatives for fish passage will also be available. Extensive data will be available from this study on the channel characteristics of the lower Yuba River. DWR also has aerial photo surveys of the river that will help in delineating adult fish holding habitat in the river. Information obtained in the proposed study will also be of value to the Comprehensive Study to better understand the ecological role of channel and floodplain configuration of Central Valley rivers.

CALFED as part of the Upper Yuba River Studies Program proposes to conduct ecological studies of the lower Yuba River in the future in support of an evaluation of fish passage at Englebright Dam upstream of Daguerre Dam. The proposed studies will help toward addressing the objectives of that program. CALFED has also initiated the Integrated Storage Investigations Program that includes evaluating the potential to modify or remove instream barriers that impede migration and spawning of anadromous fish within the Central Valley. DWR investigators from that program are participants in the YRFTWG and support the proposed studies. CALFED has also initiated the Comprehensive Monitoring, Assessment and Research Program that includes monitoring and research of the type proposed in this study. The YRFTWG will have close ties to these CALFED programs.

The project team and YRFTWG hope to maximize the system-wide benefits by providing data and reports in a timely manner, participating in scientific and public forums, and in providing peer-reviewed publications of the research conducted.

3. Requests for Next-Phase Funding

This proposal is not a request for next-phase funding, however it is an integral part of the initial phase of restoration work on the Yuba River that has already begun with the CALFED/AFRP grant Jones and Stokes received in 1998 and the CALFED grant received for developing an implementation plan by Surface Water Resources Incorporated on behalf of the YRFTWG in 1999.

4. Previous CALFED and CVPIA Funding

The YRFTWG has participated in two previous CALFED/CVPIA projects:

- The Life History and Stock Composition of Steelhead Trout – YCWA and Jones and Stokes (98-F1005-36). This study was initiated this year and includes surveys of the river habitat and steelhead spawning areas. They plan to trap steelhead in the Daguerre ladders to complement salmon trapping conducted by DFG.
- Development of an Implementation Plan for Lower Yuba River Anadromous Fish Habitat. (99-B130). This study is soon to commence with stakeholder involvement in developing an implementation plan for the lower Yuba River. The proposed studies will be fully integrated into their planning process.

Organization and Qualifications

The project team will include professional scientists and students from Natural Resources Scientists Inc., the Fishery Foundation of California, the U.S. Geological Survey, UC Davis, and Foster Wheeler Environmental. Professor Paul Maslin of the Chico State University Biology Department has expressed interest in supporting the project if the need and opportunity arises. The proposed organization chart for the project team is presented in Figure 4.

Principal Investigators:

Dave Vogel – Natural Resources Scientists Incorporated - has 25 years of experience in fisheries in river systems, lakes and reservoirs, and estuaries. He has a B.S. in biology and a M.S. in fisheries. Mr. Vogel previously worked for the U.S. Government in the U.S. Fish and Wildlife Service's Fishery Research Division and the Fishery Resources Division on Central Valley fishery resource research and management projects. Mr. Vogel has 20 years of experience in designing, directing, and conducting investigations to evaluate and improve fish passage, including long-term experience using radio-telemetry to study fish migration. Mr. Vogel used radio-telemetry to monitor movements of salmonids at the Red Bluff Diversion Dam on the mainstream Sacramento River in California during an intensive long-term investigation in the 1980s (Hallock et. al. 1982, Vogel et. al. 1988). He has continued to use this innovative fish behavior monitoring technique to assess fish passage up to the present day. Over the past 18 years, he has used telemetry to study fish migration in a wide variety of projects on the Sacramento River and the Mokelumne River and, most recently during the winter of 2000, in the tidally influenced Sacramento-San Joaquin Delta.

Charles Alpers – USGS – Dr. Alpers (Water Resources Division, U.S. Geological Survey, Sacramento, CA) received a Ph.D. in geochemistry from the University of California, Berkeley in 1986. He has been involved in numerous water-quality investigations involving trace-element geochemistry and the transport of trace elements in surface- and ground water systems. Dr. Alpers has conducted research concerning acid mine drainage at the Iron Mountain Superfund site, in cooperation with the USEPA, since joining the USGS as a post-doctoral fellow in 1987. Since joining the USGS California District in 1991, Dr. Alpers has been Project Chief for several projects, including the characterization of ground water affected by acid mine drainage at Penn Mine. He recently completed his role as Project Chief of the Sacramento River Trace Metals Transport Project, characterizing the geochemistry of trace elements, including mercury, in the Sacramento River along a reach of the river between Shasta Lake and Freeport. Dr. Alpers is a member of several technical advisory committees involved with the remediation of inactive and abandoned mine sites in California and other states, and has published extensively. Dr. Alpers is currently the project chief for an interagency project that is addressing mercury contamination from historic gold mining in the Yuba and Bear river watersheds, and he also is serving as task co-leader and quality assurance/quality control officer for the USGS portion of the CALFED project "Assessment of the effects of mercury contamination on human health and ecosystems in the Bay-Delta."

Supporting Investigators:

Trevor Kennedy –Fishery Foundation of California – Mr. Kennedy has participated in and managed fishery restoration and research projects in the Central Valley for five years. He has a B.S. in fisheries from Humboldt State University. He has extensive experience relevant to the proposed project. He developed and implemented measures to improve fish passage on the Cosumnes River via the Cosumnes River Salmonid Passage Improvement Project (CALFED 98). He developed methodologies to determine spatial and temporal densities and distribution of juvenile chinook salmon and steelhead within the Stanislaus River by direct observation. He has

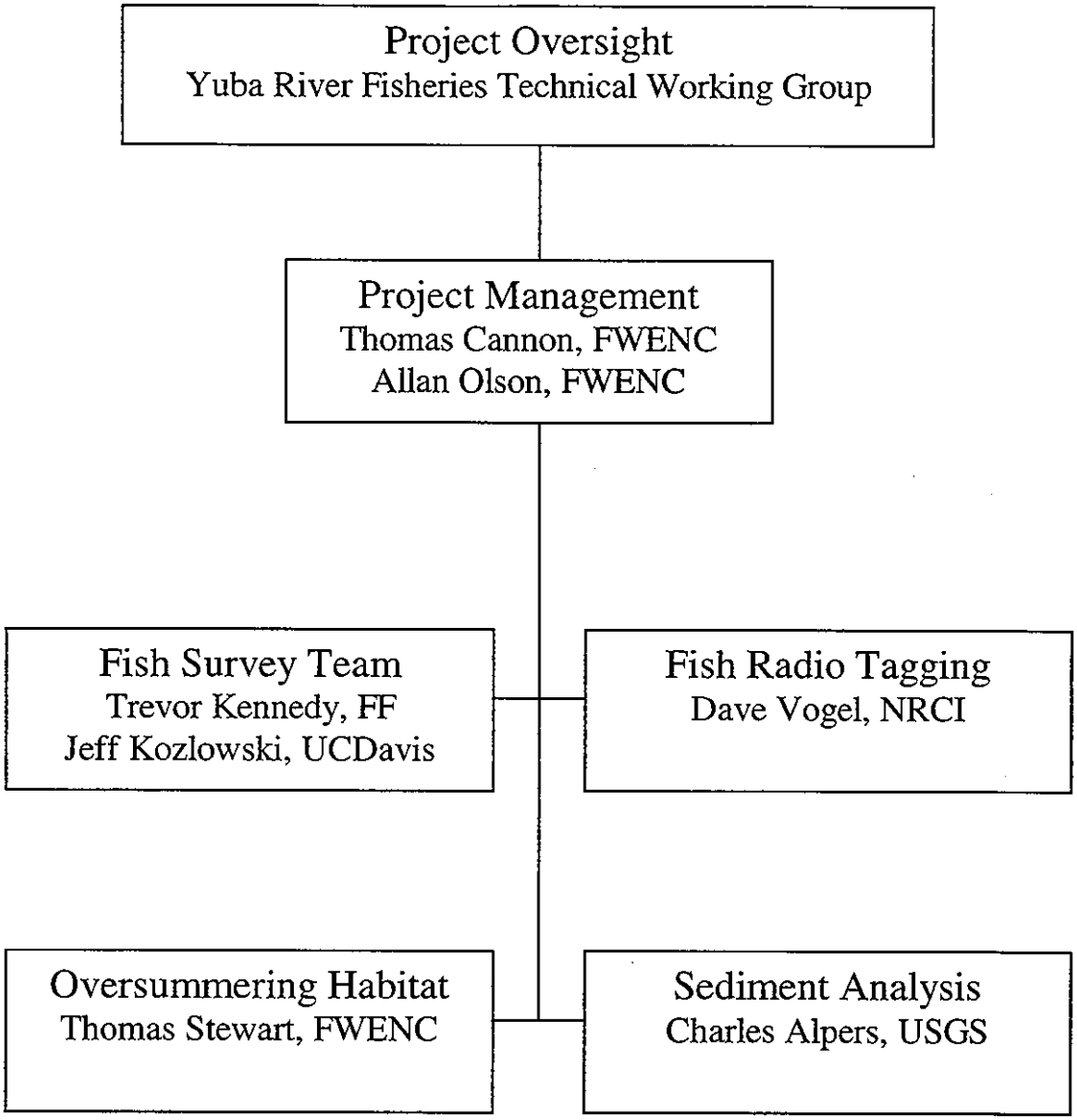


Figure 4. Project Organization

also contributed to the present understanding of how juvenile fish utilize floodplain habitats within the Cosumnes River and is currently working with the Anadromous Fish Restoration Program (AFRP) to determine habitat preferences, residence time, and the degree of stranding of juvenile chinook salmon within the Cosumnes River Preserve.

Jeff Kozlowski, UC Davis graduate student – Mr. Kozlowski is a fisheries biologist with 14 years of professional experience. He received his B.S. in Natural Resources Management (fisheries emphasis) from California Polytechnic State University. He has special expertise in fish population sampling techniques, fisheries impact assessments, stream habitat inventory procedures, stream restoration techniques, and reservoir fishery habitat enhancement. For the past 10 years, he has been a fisheries consultant performing field investigations and environmental impact assessments on a variety of projects in Northern California. He has performed field investigations on the Guadalupe River near San Jose, on the lower San Joaquin and Yuba Rivers, and on numerous small coastal and Central Valley streams. Relevant experience related to the lower Yuba River includes performing annual chinook salmon carcass surveys to estimate spawning escapement, and seining and snorkeling surveys to monitor the size, condition, distribution, and relative abundance of juvenile chinook salmon and steelhead rearing in the lower Yuba River. Presently, Mr. Kozlowski is completing his masters program at the University of California at Davis where he is conducting research on the life history, distribution, and habitat use of juvenile steelhead/rainbow trout rearing in the lower Yuba River.

Project Management Team:

Thomas Cannon, FWENC – Mr. Cannon is proposed as project manager. He has a B.S. in fisheries and masters degrees in biology and biostatistics. He has 14 years of experience working on Central Valley and Bay-Delta fish issues. He is an experienced project manager and administrator. He participated as consultant support in the early development of CALFED's Ecosystem Restoration Program Plan. He also participated as a consultant in the AFRP study program on Butte Creek, CVPIA's CAMP program, CALFED's Upper Yuba River Study Program, and the CALFED's Delta Entrainment Effects Team (DEFT). He prepared the aquatic program plan for the Lower American River Floodway Management Plan as a consultant to SAFCA. He has contributed papers on the importance of the estuary as a nursery area to chinook salmon and on the effects of South Delta Pumping Plants and PG&E Bay-Delta power plants on salmon, steelhead, and other anadromous fish.

Thomas Stewart, FWENC – Dr. Stewart is proposed as the river geomorphology task manager. He is a geomorphologist with twenty years experience in environmental evaluation, natural and water resources management, research, and project management. His areas of expertise include: geomorphology, hydrology, watershed analysis, landscape evaluation, stream channel mapping and typing, fisheries habitat evaluation, and sensitive soil and unstable slope identification particularly for riparian and fisheries habitat protection. He has worked on a variety of river systems from small headwaters streams to large rivers systems. He has used GIS in data analysis on numerous projects. His experience with large river systems includes the Eel and Mokelumne Rivers (California), Platte River (Nebraska), Mississippi River (west-central Illinois), Columbia River (Washington, Oregon, Idaho, Montana, and British Columbia), and Copper River (Alaska).

Allan Olson, FWENC – Mr. Olson is proposed as the fish study manager. He is a fisheries biologist with more than 10 years experience working on salmon and trout in the Western states with emphasis on their migratory behavior, population dynamics, and habitat requirements. His responsibilities have included fisheries task leader, task planning, database management and analysis, literature review and synthesis, and report preparation. He has utilized radio and ultrasonic tracking techniques to document adult chinook salmon and coho salmon smolt movements in riverine and estuarine habitats (Olson 1996). Mr. Olson was the task leader for documenting delays to adult spring chinook salmon at the Leaburg-Walterville hydroelectric projects on the McKenzie River, Oregon using radio tracking techniques.

Cost

1. Budget

Proposed costs are shown in Tables 1-9. Tables are organized by participating organizations and projects. Because of legal restrictions, the USGS (Task 6) cannot enter into a funding agreement directly with FWENC so other arrangements would be needed, such as a direct agreement between the USGS and CALFED.

2. Project Management

Project management costs are proposed at 16 hours per month for the project manager and an assistant for the 24-month term of the project. On hour per month is proposed for a contracts manager. These costs cover contract administration, communications (phone, letter, email, fax, etc), project oversight and inspections, report review, production, and distribution, meetings, project documentation (data and reports), coordination with other programs/projects, and progress reports. The project manager will prepare and submit monthly fiscal and programmatic reports on the 10th of each month. The report will include amount invoiced to contracting agency, a description of the activities performed, problems and delays encountered, and descriptions of any amendments or modifications to the contract. The report will be emailed to contracting entity, YRFTWG members, and CALFED representatives.

In addition, the fish study manager is also included under project management. His role will be to coordinate and supervise the quarterly fish surveys, prepare monthly progress reports, annual reports, and participation in coordination with other programs.

3. Cost Sharing

Cost sharing will be in the form of in-kind services from the organizations participating in the YRFTWG. These services include personnel participating in the YRFTWG as well as selected support from their member organizations, particularly local involvement. Such support may include but is not limited to use of equipment, vehicles, support personnel, river access, facilities for meetings, etc. Support from ongoing studies (e.g., carcass surveys, ladder fish counts, angler surveys, spawning surveys, tag studies, life history studies, etc.) on the Yuba River being conducted by YRFTWG is also essential to accomplishing the program.

C. Local Involvement

The proposed project has extensive local involvement already in place with interested parties supporting and sponsoring the project. The YRFTWG includes stakeholder members including the South Yuba River Citizens League (SYRCL), Reclamation District (RD) 783, and YCWA. Last year's CALFED grant to Surface Water Resources Incorporated (SWRI) representing YRFTWG includes instituting public involvement for lower Yuba River restoration including Daguerre Point Dam. That effort is just beginning and will include the proposed studies. Other local involvement processes that will serve as further points of contacts include those of CALFED's Upper Yuba River Studies Program, which includes local involvement in potential effects on the lower river from potential actions at Englebright Dam. Cooperation with USACE and Reclamation Board's Comprehensive Study will also provide public involvement through that process. In addition, the USACE/DWR NEPA/CEQA process involving Daguerre Point Dam alternatives is expected to begin during the study and that process will include scoping and public involvement.

Compliance with Standard Terms and Conditions

Foster Wheeler and its partners presently have contracts with CALFED's state and federal entities and no problems are anticipated with terms and conditions.

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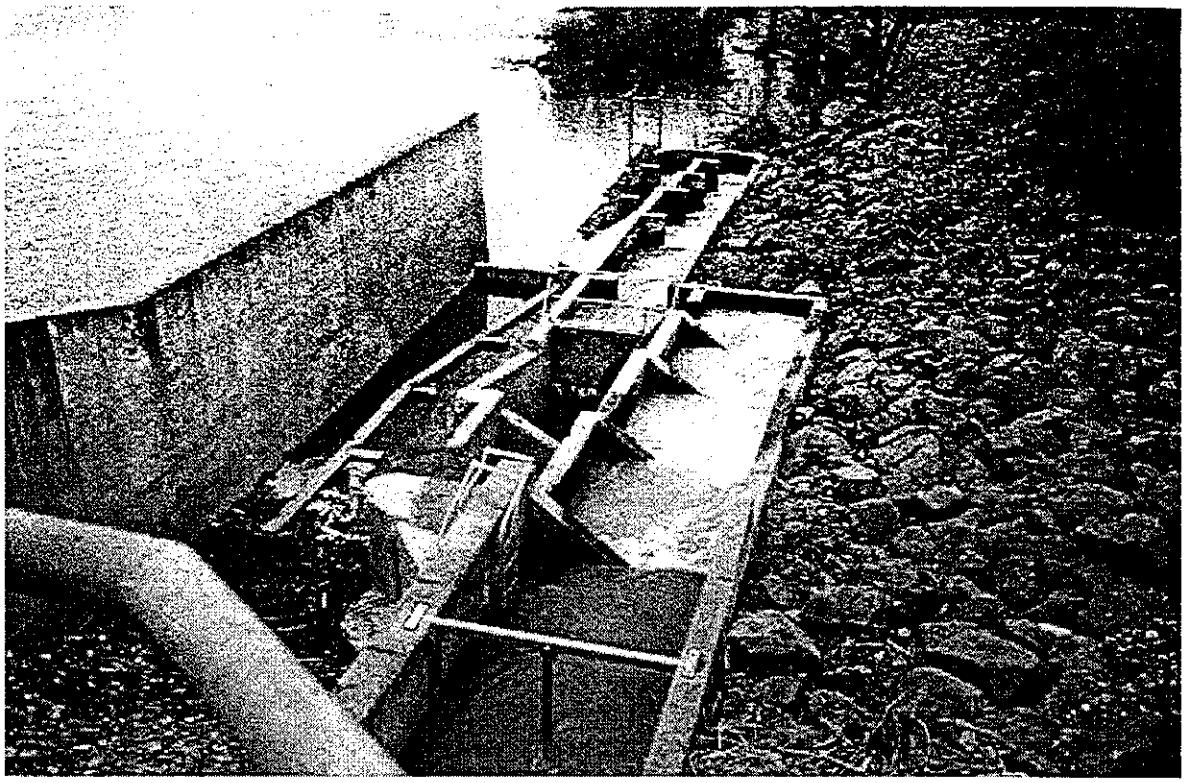
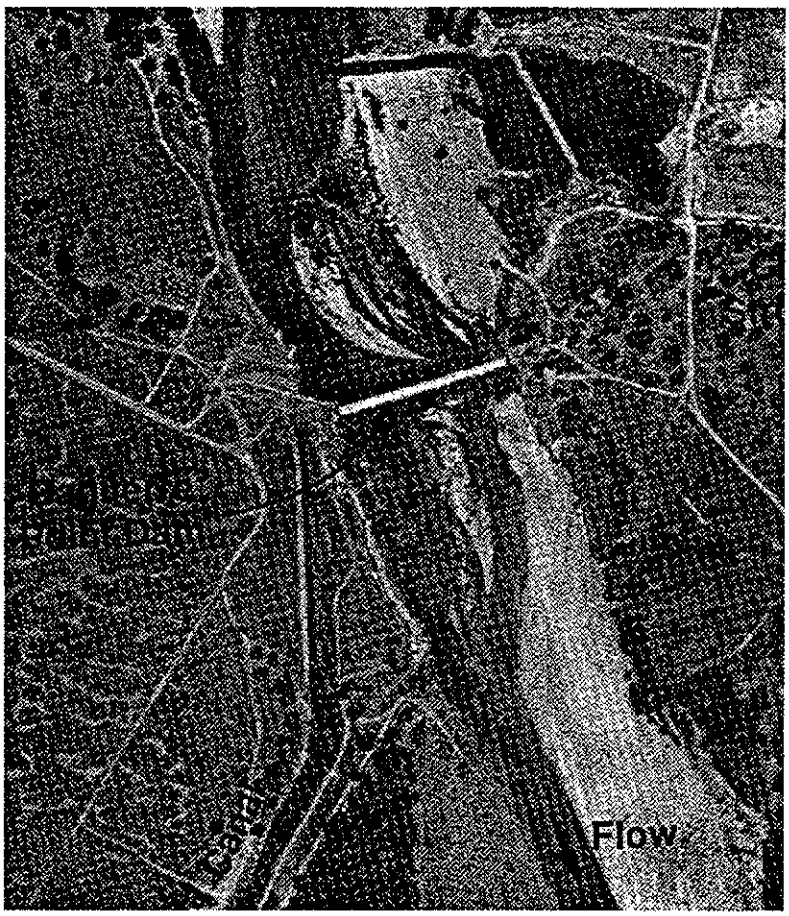
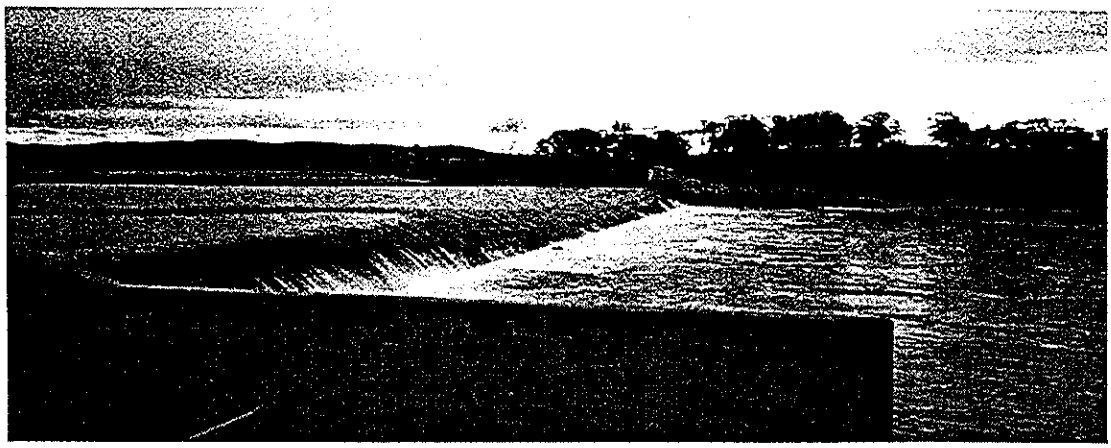


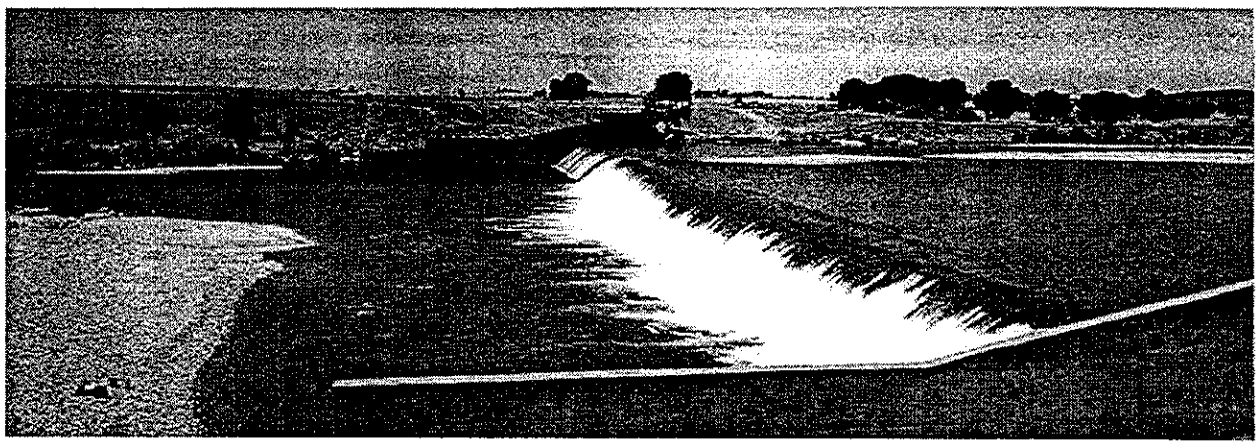
North ladder at Daguerre Point Dam



Daguerre Point Dam



Looking South at Daguerre Point Dam



Looking North at Daguerre Point Dam

Table 1 - Worksheet Task 1 - Adult Salmon and Steelhead Distribution

					Subject to Overhead						Exempt from Overhead		
Year	Staff	Organization	Pay Rate/hr	Direct Labor Hours	Salary	Benefits	Travel (31 cents per mile travel to Yuba from Sacramento)	Supplies & Expendables (note books, disposable camera, clipboards, boat gear, personal gear)	Service Contracts	Overhead (18%)1		Equipment (heavy duty raft, snorkel gear)	Total Cost
1	T. Kennedy	Fishery Foundation	30	168	5040	1260	400	250		1640		300	8890
	J. Koslowski	Student Contractor	25	168	4200	1050	400	250		1377.5		300	7578
	Field Tech	Fishery Foundation	17.5	96	1680	420	200			545		300	3145
	Field Tech	Fishery Foundation	17.5	96	1680	420	200			545		300	3145
	Field Tech	Fishery Foundation	17.5	96	1680	420	200			545		300	3145
	raft					0				0		2500	2500
	Subtotal			624	14280	3570	1400	500	0	4652.5	0	4000	28402.5
2	T. Kennedy	Fishery Foundation	30	168	5040	1260	400	250		1640		100	8690
	J. Koslowski	Studyent Contractor	25	168	4200	1050	400	250		1377.5		100	7378
	Field Tech	Fishery Foundation	17.5	96	1680	420	200			545		100	2945
	Field Tech	Fishery Foundation	17.5	96	1680	420	200			545		100	2945
	Field Tech	Fishery Foundation	17.5	96	1680	420	200			545		100	2945
	Subtotal			624	14280	3570	1400	500	0	4652.5	0	500	24902.5
	Total			1,248	28,560	7,140	2,800	1,000	0	9,305	0	4,500	53,305

Footnotes:

1 Overhead is for office space, phones, cell phones, furniture, office staff support, subcontract administration, purchasing agents, general supplies, and general personnel administration.

Table 2 - Worksheet Task 2a - Adult Salmon and Steelhead Movement Past Daguerre Dam-fish marking													
					Subject to Overhead						Exempt from Overhead		
Year	Staff	Organization	Pay Rate/hr	Direct Labor Hours	Salary	Benefits	Travel (31 cents per mile travel to Yuba from Sacramento)	Supplies & Expendables (note books, tagging gear and tags, clipboards, boat gear, personal gear)	Service Contracts	Overhead (18%) 1	Travel	Equipment (heavy duty raft, snorkel gear)	Total Cost
1	T. Kennedy	Fishery Foundation	30	168	5040	1260	400	250		1640		300	8890
	J. Koslowski	Student Contractor	25	168	4200	1050	400	250		1377.5		300	7578
	Field Tech	Fishery Foundation	17.5	96	1680	420	200			545		300	3145
	Field Tech	Fishery Foundation	17.5	96	1680	420	200			545		300	3145
	Field Tech	Fishery Foundation	17.5	96	1680	420	200			545		300	3145
	raft	raft				0				0		2500	2500
	Subtotal	Subtotal Year 1		624	14280	3570	1400	500	0	4652.5	0	4000	28402.5
2	T. Kennedy	Fishery Foundation	30	168	5040	1260	400	250		1640		100	8690
	J. Koslowski	Studyent Contractor	25	168	4200	1050	400	250		1377.5		100	7378
	Field Tech	Fishery Foundation	17.5	96	1680	420	200			545		100	2945
	Field Tech	Fishery Foundation	17.5	96	1680	420	200			545		100	2945
	Field Tech	Fishery Foundation	17.5	96	1680	420	200			545		100	2945
	Subtotal	Subtotal Year 2		624	14280	3570	1400	500	0	4652.5	0	500	24902.5
	Total	Total		1,248	$28,560	$7,140	$2,800	$1,000	$0	$9,305	$0	$4,500	$53,305

Footnotes:

1 Overhead is for office space, phones, cell phones, furniture, office staff support, subcontract administration, purchasing agents, and general personnel administration.

Table 3 - Worksheet TASK 2b - Radio-tagging												
										Exempt from Overhead		
Year	Person/Position/Category	Pay Rate/hr	Direct Labor Hours	Salary	Benefits	Travel	Supplies & Expendables*	Service Contracts	Overhead** (23% of total)	Equipment	Graduate Student Fee Remission	Total Cost
Year 1	Dave Vogel, Senior Scientist	44.75	160	$7,160	$1,432				$6,587			$14,320
	Keith Marine, Fishery Biol.	25.34	100	$2,534	$507				$2,331			$5,068
	Field Biologist	12.895	1200	$15,474	$3,095				$14,236			$30,948
	Tech. Rept. Writer/Admin.	15.915	60	$955	$191				$879			$1,910
	Expenses					$5,486	$32,098		$3,758			$37,584
Total Cost Year 1			1520	$26,123	$5,225	$5,486	$32,098	$0	$20,898	$0	$0	$89,830
Year 2	Dave Vogel, Senior Scientist	46.09	160	$7,374	$1,475				$6,784			$14,749
	Keith Marine, Fishery Biol.	26.1	100	$2,610	$522				$2,401			$5,220
	Field Biologist	13.28	1200	$15,936	$3,187				$14,661			$31,872
	Clerical/Admin.	16.39	60	$983	$197				$905			$1,967
	Expenses					$5,650	$32,098		$3,775			$37,748
Total Cost Year 2			1520	$26,904	$5,381	$5,650	$32,098	$0	$21,523	$0	$0	$91,556
Total Project Cost			3040	$53,027	$10,605	$11,136	$64,196	$0	$42,421	$0	$0	$181,385

* Supplies and expendables include purchase of expendable radio tags, rentals of radio receivers and antennae, electronic data loggers, and vehicles, and consumable field s

** Overhead includes workers compensation, office rent, phones, commercial general liability and professional liability insurance, state disability insurance, utilities, computer hardware and software, furniture, office equipment and supplies, and unbillable labor of support staff

Table 4 - Worksheet Task 3 - Survey of Hydraulic Characteristics of Daguerre Dam and Ladders													
					Subject to Overhead						Exempt from Overhead		
Year	Staff	Organization	Pay Rate/Hr	Direct Labor Hours	Salary	Benefits	Travel (31 cents per mile travel to Yuba from Sacramento)	Supplies & Expendables (note books, disposable camera, clipboards, boat gear, personal gear)	Service Contracts	Overhead (17%) 1	Travel	Equipment (heavy duty raft, snorkel gear)	Total Cost
1	Kennedy, T.	Fishery Foundation	30	80	2400	600	240	250		799		300	4589
	Koslowski, J	Student Contractor	25	80	2000	500	240	250		674		300	3964
	Subtotal			160	4400	1100	480	500	0	1473	0	600	8553
2	Kennedy, T.		30	80	2400	600	240	250		799		300	4589
	Koslowski, J		25	80	2000	500	240	250		674		300	3964
	Subtotal			160	4400	1100	480	500	0	1473	0	600	8553
Total	Total			320	$8,800	$2,200	$960	$1,000	$0	$2,946	$0	$1,200	$17,106

Footnotes:

1 Overhead is for office space, phones, cell phones, furniture, office staff support, subcontract administration, purchasing agents, and general personnel administration.

Table 5 - Worksheet for Task 4 - Predation Study Survey

				Subject to Overhead						Exempt from Overhead			
Year	Staff	Pay Rate/hr	Direct Labor Hours	Salary	Benefits	Travel (31 cents per mile travel to Yuba from Sacramento)	Supplies & Expendables (note books, disposable camera, clipboards, boat gear, personal gear)	Service Contracts	Overhead (18%) 1	Travel	Equipment (heavy duty raft, snorkel gear)	Total Cost	
1	T. Kennedy	30	168	5040	1260	400	250		1640		300	8890	
	J. Koslowski	25	168	4200	1050	400	250		1377.5		300	7578	
	Field Tech	17.5	96	1680	420	200			545		300	3145	
	Field Tech	17.5	96	1680	420	200			545		300	3145	
	Field Tech	17.5	96	1680	420	200			545		300	3145	
	raft				0				0		2500	2500	
	Subtotal		624	14280	3570	1400	500	0	4652.5	0	4000	28402.5	
2	T. Kennedy	30	168	5040	1260	400	250		1640		100	8690	
	J. Koslowski	25	168	4200	1050	400	250		1377.5		100	7378	
	Field Tech	17.5	96	1680	420	200			545		100	2945	
	Field Tech	17.5	96	1680	420	200			545		100	2945	
	Field Tech	17.5	96	1680	420	200			545		100	2945	
	Subtotal		624	14280	3570	1400	500	0	4652.5	0	500	24902.5	
Total	Total		1,248	$28,560	$7,140	$2,800	$1,000	$0	$9,305	$0	$4,500	$53,305	

Footnotes:

1 Overhead is for office space, phones, cell phones, furniture, office staff support, subcontract administration, purchasing agents, and general personnel administration.

Table 6 - Worksheet for Task 5 - Oversummering Habitat Conditions												
				Subject to Overhead						Exempt from Overhead		
Year	Staff	Pay Rate/hr	Direct Labor Hours	Salary	Benefits	Travel (31 cents per mile travel to Yuba from Sacramento)	Supplies & Expendables	Service Contracts	Overhead (54%)	Equipment (charge for GIS station)	Graduate Student Fee Remission	Total Cost
1	Stewart, T.	42	85	3570	892.5	120			5706.15			10288.65
	GIS/Field Support	25	120	3000	750				4785	500		9035
	Total		205	6570	1642.5	120	0	0	10491.15	500	0	19323.65

Table 7 - Worksheet for Task 6. Sample sediments and pore waters behind Daguerre Point Dam and analyze for toxins											
			Subject to Overhead						Exempt from Overhead		
Year	Staff	Direct Labor Hours	Salary	Benefits	Travel	Supplies & Expendables	Service Contracts	Overhead (show % here)	Equipment	Graduate Student Fee Remission	Total Cost
1	Alpers	290	$12,598	$3,712							
1	Dileanis	100	$3,183	$528							
1	Elizabeth	100	$1,241	$95							
1	Gallanthine	100	$2,390	$337							
1	Gobert	20	$413	$116							
1	Hunerlach	350	$8,206	$2,832							
1	Johnson	100	$2,347	$610							
1	Knifong	50	$1,066	$295							
1	Kinsey	100	$2,733	$370							
1	Sklarsky	20	$654	$177							
1											
1	total labor	1230	$34,832	$9,073				49.7%			$87,284
1					$1,600			49.7%			$3,181
1						$11,895		49.7%			$23,647
1	(Drilling)						$82,000	21.3%			$104,218
1	(Laboratory)						$33,000	40.8%			$55,699
1											
1	Total year 1										$274,029
2	Alpers	290	$13,422	$3,955							
2	Dileanis	100	$3,392	$563							
2	Elizabeth	100	$1,322	$101							
2	Gallanthine	0	$0	$0							
2	Gobert	180	$3,963	$1,116							
2	Hunerlach	222	$5,546	$1,914							
2	Johnson	0	$0	$0							
2	Knifong	50	$1,136	$314							
2	Kinsey	0	$0	$0							
2	Sklarsky	180	$6,274	$1,698							
2											
2	total labor	1122	$35,055	$9,661				49.7%			$88,894
2					$0			49.7%			$0
2						$3,000		49.7%			$5,964
2	(Laboratory)						$11,312	40.8%			$19,093
2											
2	Total year 2										$113,951
	Total, years 1 and 2										$387,980

Note that overhead rates assume non-Federal funds
General overhead rate for federal funds is 47.2% of gross costs
Laboratory overhead rates range from 21.3% to 49.7%
depending on laboratory

Table 8 - Worksheet for Task 7 - Project Management

				Subject to Overhead						Exempt from Overhead		
Year	Staff	Pay Rate/hr	Direct Labor Hours	Salary	Benefits	Travel (31 cents per mile for travel to Yuba County from Sacramento)	Supplies & Expendables (office supplies, report materials, mail, long-distance phone charges)	Service Contracts	Overhead (54% of total)1		Equipment	Total Cost
1	Cannon, T	43	192	8256	2064	400	500		13051.92			24271.92
	Fahrenbach, D.	42	12	504	126				791.28			1421.28
	Proj assistant	15	192	2880	720	200			4541.6			8341.6
	Olson, A. fish task mngr	40	96	3840	960	200			6048.8			11048.8
	Subtotal		492	15480	3870	800	500	0	24433.6	0	0	45083.6
2	Cannon, T.	45	192	8640	2160	400	500		13654.8			25354.8
	Fahrenbach, D.	44	12	528	132				828.96			1488.96
	Olson, A. fish task mngr	42	96	4032	1008	200			6350.24			11590.24
	Proj assistant	16	192	3072	768	200			4843.04			8883.04
	Subtotal		492	16272	4068	800	500	0	25677.04	0	0	47317.04
	Total		984	31752	7938	1600	1000	0	50110.64	0	0	92400.64

Footnotes:

1 Overhead is for personnel benefits, office space, phones, cell phones, furniture, office staff support, subcontract administration, purchasing agents, and general personnel administration.

Table 9. Worksheet for Total Budget (CALFED funds only)											
			Subject to Overhead						Exempt from Overhead		
Year	Task	Direct Labor Hours	Salary	Benefits	Travel	Supplies & Expendables	Service Contracts	Overhead (34%)		Equipment	Total Cost
Year 1	Task 1 - Adult Salmon/Steelhead Distribution Survey	624	$14,280	$3,570	$1,400	$500	$0	$4,653	$0	$4,000	$28,403
	Task 2a - Adult Salmon/Steelhead Passage Study - ma	624	$14,280	$3,570	$1,400	$500	$0	$4,653	$0	$4,000	$28,403
	Task 2b - Adult Salmon/Steelhead Passage Study - rad	1520	$26,123	$5,225	$5,486	$32,098	$0	$20,898	$0	$0	$89,830
	Task 3 - Hydraulic Characterization/Daguerre Dam and ladders	160	$4,400	$1,100	$480	$500	$0	$1,473	$0	$600	$8,553
	Task 4 - Predation Study Survey	624	$14,280	$3,570	$1,400	$500	$0	$4,653	$0	$4,000	$28,403
	Task 5 - Survey of Oversummering Habitats	205	$6,570	$1,643	$120	$0	$0	$10,491	$500	$0	$19,324
	Task 6 - Sediment Survey (toxins and sediment composition)	1230	$34,832	$9,073	$1,600	$11,895	$115,000	$101,665	$0	$0	$274,029
	Task 7 - Project Management (includes fish tasks leader and benefits)	492	$15,480	$3,870	$800	$500	$0	$24,434	$0	$0	$45,084
Total Cost Year 1		5,479	$130,245	$31,620	$12,686	$46,493	$115,000	$172,918	$500	$12,600	$522,027
Year 2	Task 1 - Adult Salmon/Steelhead Distribution Survey	624	$14,280	$3,570	$1,400	$500	$0	$4,653	$0	$500	$24,903
	Task 2a - Adult Salmon/Steelhead Passage Study - ma	624	$14,280	$3,570	$1,400	$500	$0	$4,653	$0	$500	$24,903
	Task 2b - Adult Salmon/Steelhead Passage Study - rad	1520	$26,904	$5,381	$5,650	$32,098	$0	$21,523	$0	$0	$91,556
	Task 3 - Hydraulic Characterization/Daguerre Dam and ladders	160	$4,400	$1,100	$480	$500	$0	$1,473	$0	$600	$8,553
	Task 4 - Predation Study Survey	624	$14,280	$3,570	$1,400	$500	$0	$4,653	$0	$500	$24,903
	Task 5 - Survey of Adult Salmon/Steelhead Oversummering Habitats	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Task 6 - Sediment Survey (toxins and sediment composition)	1122	$35,055	$9,661	$0	$3,000	$11,312	$54,924	$0	$0	$113,951
	Task 7 - Project Management (includes fish tasks leader and benefits)	492	$16,272	$4,068	$800	$500	$0	$25,677	$0	$0	$47,317
Total Cost Year 2		5,166	$125,471	$30,920	$11,130	$37,598	$11,312	$117,555	$0	$2,100	$336,084
Total Project Cost		10,645	$255,716	$62,540	$23,816	$84,091	$126,312	$290,473	$500	$14,700	$858,111

FOSTER WHEELER ENVIRONMENTAL CORPORATION

May 12, 2000

Jim Manning - Director
Yuba County Department of Community Development
938 14th Street
Marysville, CA 95901

Subject: PROPOSAL TO CALFED

Foster Wheeler Environmental Corporation is submitting the attached grant proposal to CALFED to conduct scientific research on the lower Feather and Yuba Rivers on behalf of the Yuba River Fish Technical Working Group. We are sending you this proposal to provide advance notification regarding research studies that may occur if the grant is awarded in your jurisdiction. Foster Wheeler would serve as project manager for the studies, which would be conducted in the lower Yuba River in the vicinity of Daguerre Point Dam.

The objective of the study are to provide technical information on fish passage at the dam that would be used subsequently in support of decisions relating to the fate of the dam such as construction of new fish passage facilities or dam removal. Such information would include a characterization of the sediments behind the dam and the amount of mercury in the sediments. Studies would also include fish marking and radio-tracking to monitor fish passage at the dam.

The studies are supported by all the Working Group members including the Yuba County Water Agency and Reclamation District 784.

Your support and cooperation will be greatly appreciated. If you have any questions regarding the study please call me.

Sincerely,

Thomas C. Cannon

c:

3947 Lennane Drive, Suite 200, Sacramento, CA 95834-1973
Tel: 916-928-0202 Fax: 916-928-0594

Environmental Compliance Checklist

All applicants must fill out this Environmental Compliance Checklist. Applications must contain answers to the following questions to be responsive and to be considered for funding. *Failure to answer these questions and include them with the application will result in the application being considered nonresponsive and not considered for funding.*

1. **Do any of the actions included in the proposal require compliance with either the California Environmental Quality Act (CEQA), the National Environmental Policy Act (NEPA), or both?**

   _____ YES X NO

2. **If you answered yes to # 1, identify the lead governmental agency for CEQA/NEPA compliance.**

   _____
   Lead Agency

3. **If you answered no to # 1, explain why CEQA/NEPA compliance is not required for the actions in the proposal.**

   Actions are Research

4. **If CEQA/NEPA compliance is required, describe how the project will comply with either or both of these laws. Describe where the project is in the compliance process and the expected date of completion.**

5. **Will the applicant require access across public or private property that the applicant does not own to accomplish the activities in the proposal?**

   X YES _____ NO

   If yes, the applicant must attach written permission for access from the relevant property owner(s). Failure to include written permission for access may result in disqualification of the proposal during the review process. Research and monitoring field projects for which specific field locations have not been identified will be required to provide access needs and permission for access with 30 days of notification of approval.

6. **Please indicate what permits or other approvals may be required for the activities contained in your proposal. Check all boxes that apply.**

LOCAL

Conditional use permit	___	
Variance	___	
Subdivision Map Act approval	___	
Grading permit	___	
General plan amendment	___	
Specific plan approval	___	
Rezone	___	
Williamson Act Contract cancellation	___	
Other _____ (please specify)	___	
None required	___	

STATE

CESA Compliance	___	(CDFG)
Streambed alteration permit	___	(CDFG)
CWA § 401 certification	___	(RWQCB)
Coastal development permit	___	(Coastal Commission/BCDC)
Reclamation Board approval	___	
Notification	___	(DPC, BCDC)
Other Research and Monitoring (please specify)		
None required	___	

FEDERAL

ESA Consultation	___	(USFWS)
Rivers & Harbors Act permit	___	(ACOE)
CWA § 404 permit	___	(ACOE)
Other Research and Monitoring (please specify)		
None required	___	

DPC = Delta Protection Commission
CWA Clean Water Act
CESA = California Endangered Species Act
USFWS = U.S. Fish and Wildlife Service
ACOE – U.S. Army Corps of Engineers

ESA = Endangered Species Act
CDFG = California Department of Fish and Game
RWQCB = Regional Water Quality Control Board
BCDC – Bay Conservation and Development Comm.

Land Use Checklist

All applicants must fill out this Land Use Checklist for their proposal. Applications must contain answers to the following questions to be responsive and to be considered for funding. *Failure to answer these questions and include them with the application will result in the application being considered nonresponsive and not considered for funding.*

1. **Do the actions in the proposal involve physical changes to the land(i.e. grading, planting vegetation, or breeching levees) or restrictions in land use (i.e. conservation easement or placement of land in a wildlife refuge)?**

   _____ YES X NO

2. **If NO to # 1, explain what type of actions are involved in the proposal (i.e., research only, planning only).**

   Research only.

3. **If YES to # 1, what is the proposed land use change or restriction under the proposal?**

4. **If YES to # 1, is the land currently under a Williamson Act contract?**

   _____ YES _____ NO

5. **If YES to # 1, answer the following:**

   Current land use _____
   Current zoning _____
   Current general plan designation _____

6. **If YES to #1, is the land classified as Prime Farmland, Farmland of Statewide Importance or Unique Farmland on the Department of Conservation Important Farmland Maps?**

   _____ YES _____ NO _____ DON'T KNOW

7. **If YES to # 1, how many acres of land will be subject to physical change or land use restrictions under the proposal?**

   _____

8. **If YES to # 1, is the property currently being commercially farmed or grazed?**

   _____ YES _____ NO

9. **If YES to #8, what are** **the number of employees/acre**_____
   the total number of employees _____

10. Will the applicant acquire any interest in land under the proposal (fee title or a conservation easement)?

YES	NO
_____	X

11. What entity/organization will hold the interest?_____

12. If YES to # 10, answer the following:

Total number of acres to be acquired under proposal	_____
Number of acres to be acquired in fee	_____
Number of acres to be subject to conservation easement	_____

13. For all proposals involving physical changes to the land or restriction in land use, describe what entity or organization will:

manage the property	_____
provide operations and maintenance services	_____
conduct monitoring	_____

14. For land acquisitions (fee title or easements), will existing water rights also be acquired?

YES	NO
_____	_____

15. Does the applicant propose any modifications to the water right or change in the delivery of the water?

YES	NO
_____	X

16. If YES to # 15, describe_____

OMB Approval No. 0348-0040

ASSURANCES - NON-CONSTRUCTION PROGRAMS

PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.

NOTE: Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the awarding agency. Further, certain Federal awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant, I certify that the applicant:

1. Has the legal authority to apply for Federal assistance and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project cost) to ensure proper planning, management and completion of the project described in this application.

2. Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to the award; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.

3. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.

4. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.

5. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. §§4728-4763) relating to prescribed standards for merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).

6. Will comply with all Federal statutes relating to nondiscrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§1681-1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. §794), which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C. §§6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 ee 3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and, (j) the requirements of any other nondiscrimination statute(s) which may apply to the application.

7. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal or federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.

8. Will comply, as applicable, with provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.

9. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§276a to 276a-7), the Copeland Act (40 U.S.C. §276c and 18 U.S.C. §874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§327-333), regarding labor standards for federally-assisted construction subagreements.

10. Will comply, if applicable, with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is $10,000 or more.

11. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. §§7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).

12. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.

13. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. §470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §§469a-1 et seq.).

14. Will comply with P.L. 93-348 regarding the protection of human subjects involved in research, development, and related activities supported by this award of assistance.

15. Will comply with the Laboratory Animal Welfare Act of 1966 (P.L. 89-544, as amended, 7 U.S.C. §§2131 et seq.) pertaining to the care, handling, and treatment of warm blooded animals held for research, teaching, or other activities supported by this award of assistance.

16. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.

17. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Profit Organizations."

18. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL	TITLE
J. Lynn Swagger	OPERATIONS MANAGER
APPLICANT ORGANIZATION	DATE SUBMITTED
FOSTER WHEELER ENVIRONMENTAL CORPORATION	5/15/00

STATE OF CALIFORNIA

NONDISCRIMINATION COMPLIANCE STATEMENT

STD. 19 (REV. 3-95) FMC

COMPANY NAME

Foster Wheeler Environmental Corporation

The company named above (hereinafter referred to as "prospective contractor") hereby certifies, unless specifically exempted, compliance with Government Code Section 12990 (a-f) and California Code of Regulations, Title 2, Division 4, Chapter 5 in matters relating to reporting requirements and the development, implementation and maintenance of a Nondiscrimination Program. Prospective contractor agrees not to unlawfully discriminate, harass or allow harassment against any employee or applicant for employment because of sex, race, color, ancestry, religious creed, national origin, disability (including HIV and AIDS), medical condition (cancer), age, marital status, denial of family and medical care leave and denial of pregnancy disability leave.

CERTIFICATION

I, the official named below, hereby swear that I am duly authorized to legally bind the prospective contractor to the above described certification. I am fully aware that this certification, executed on the date and in the county below, is made under penalty of perjury under the laws of the State of California.

OFFICIAL'S NAME

G. Lynn Sprague

DATE EXECUTED

May 15, 2000

EXECUTED IN THE COUNTY OF

Sacramento County

PROSPECTIVE CONTRACTOR'S SIGNATURE

G. Lynn Sprague

PROSPECTIVE CONTRACTOR'S TITLE

Northern California Operations Manager

PROSPECTIVE CONTRACTOR'S LEGAL BUSINESS NAME

Foster Wheeler Environmental Corporation

OMB Approval No. 0348-0043

APPLICATION FOR FEDERAL ASSISTANCE

2. DATE SUBMITTED	Applicant Identifier
3. DATE RECEIVED BY STATE	State Application Identifier
4. DATE RECEIVED BY FEDERAL AGENCY	Federal Identifier

1. TYPE OF SUBMISSION:

Application
- ☐ Construction
- ☒ Non-Construction

Preapplication
- ☐ Construction
- ☐ Non-Construction

5. APPLICANT INFORMATION

Legal Name:
Foster Wheeler Environmental Corporation

Organizational Unit:

Address *(give city, county, State, and zip code)*:
3947 Lennane Drive, Suite 200

Sacramento, CA 95843

Name and telephone number of person to be contacted on matters involving this application *(give area code)* **Thomas C. Cannon**

916-928-0202

6. EMPLOYER IDENTIFICATION NUMBER *(EIN)*:
7 5 - 2 5 1 2 4 5 0

7. TYPE OF APPLICANT: *(enter appropriate letter in box)*

A. State
B. County
C. Municipal
D. Township
E. Interstate
F. Intermunicipal
G. Special District
H. Independent School Dist.
I. State Controlled Institution of Higher Learning
J. Private University
K. Indian Tribe
L. Individual
M. Profit Organization
N. Other (Specify) _____

8. TYPE OF APPLICATION:

☐ New ☐ Continuation ☐ Revision

If Revision, enter appropriate letter(s) in box(es) ☐ ☐

A. Increase Award B. Decrease Award C. Increase Duration
D. Decrease Duration Other *(specify)*:

9. NAME OF FEDERAL AGENCY:

10. CATALOG OF FEDERAL DOMESTIC ASSISTANCE NUMBER:

XX.XXX

TITLE:

11. DESCRIPTIVE TITLE OF APPLICANT'S PROJECT:

Lower Yuba River Monitoring and Research Program

A Proposal to Conduct a Monitoring and Research Program to Support Federal and State Actions to Improving Anadrom Fish Passage and Habitat on the Lower Yuba River in Yuba County, California.

12. AREAS AFFECTED BY PROJECT *(Cities, Counties, States, etc.)*:

Yuba County

13. PROPOSED PROJECT

Start Date	Ending Date
01/01/2001	12/31/2001

14. CONGRESSIONAL DISTRICTS OF:

a. Applicant: **California Fifth Congressional District**

b. Project: **Lower Yuba River Monitoring and Research Project**

15. ESTIMATED FUNDING:

a. Federal	$ 858,111 .00
b. Applicant	$ .00
c. State	$ .00
d. Local	$ .00
e. Other	$ .00
f. Program Income	$ .00
g. TOTAL	$ 858,111 .00

16. IS APPLICATION SUBJECT TO REVIEW BY STATE EXECUTIVE ORDER 12372 PROCESS?

a. YES. THIS PREAPPLICATION/APPLICATION WAS MADE AVAILABLE TO THE STATE EXECUTIVE ORDER 12372 PROCESS FOR REVIEW ON:

DATE _____

b. No. ☐ PROGRAM IS NOT COVERED BY E. O. 12372
☐ OR PROGRAM HAS NOT BEEN SELECTED BY STATE FOR REVIEW

17. IS THE APPLICANT DELINQUENT ON ANY FEDERAL DEBT?

☐ Yes If "Yes," attach an explanation. ☒ No

18. TO THE BEST OF MY KNOWLEDGE AND BELIEF, ALL DATA IN THIS APPLICATION/PREAPPLICATION ARE TRUE AND CORRECT, THE DOCUMENT HAS BEEN DULY AUTHORIZED BY THE GOVERNING BODY OF THE APPLICANT AND THE APPLICANT WILL COMPLY WITH THE ATTACHED ASSURANCES IF THE ASSISTANCE IS AWARDED.

a. Type Name of Authorized Representative	b. Title	c. Telephone Number
G. Lynn Sprague	Operations Manager	(916) 928-0202

d. Signature of Authorized Representative: /s/ G. Lynn Sprague

e. Date Signed: 5/15/00

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Prescribed by OMB Circular A-102

BUDGET INFORMATION - Non-Construction Programs

OMB Approval No. 0348-0044

SECTION A - BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1.		$	$	$	$	$
2.						
3.						
4.						
5. Totals		$	$	$	$	$

SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY				Total
	(1) Proposal	(2)	(3)	(4)	(5)
a. Personnel	$ 255,716	$	$	$	$ 255,716
b. Fringe Benefits	62,540				62,540
c. Travel	23,816				23,816
d. Equipment	14,700				14,700
e. Supplies	84,091				84,091
f. Contractual	126,312				126,312
g. Construction					
h. Other					
i. Total Direct Charges *(sum of 6a-6h)*	567,675				567,675
j. Indirect Charges	290,473				290,473
k. TOTALS *(sum of 6i and 6j)*	$ 858,148	$	$	$	$ 858,148
7. Program Income	$	$	$	$	$

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SECTION C - NON-FEDERAL RESOURCES

(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e) TOTALS
8.	$	$	$	$
9.				
10.				
11.				
12. TOTAL *(sum of lines 8-11)*	$	$	$	$

SECTION D - FORECASTED CASH NEEDS

	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	$ 522,027	$ 120,000	$ 150,000	$ 150,000	$ 102,027
14. Non-Federal					
15. TOTAL *(sum of lines 13 and 14)*	$ 522,027	$ 120,000	$ 150,000	$ 150,000	$ 102,027

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT

(a) Grant Program	FUTURE FUNDING PERIODS (Years)			
	(b) First	(c) Second	(d) Third	(e) Fourth
16.	$	$	$	$
17.				
18.				
19.				
20. TOTAL *(sum of lines 16-19)*	$	$	$	$

SECTION F - OTHER BUDGET INFORMATION

21. Direct Charges:	22. Indirect Charges:
23. Remarks:	